

**REMARKS/ARGUMENTS**

**1. Claim Amendments**

The Applicant has amended claims 1, 11, 13, 21, 23 and 28 and canceled claims 2, 12, 14 and 22. Applicant respectfully submits no new matter has been added. Accordingly, claims 1, 3-11, 13, 15-21, and 23-28 are pending in the application. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and the following remarks.

**2. Claim Rejections – 35 U.S.C. § 112**

Claims 11, 12, 21, and 22 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 11 and 21 have been amended to overcome the rejection. Claims 12 and 22 have been canceled, rendering the rejection moot.

**3. Claim Rejections – 35 U.S.C. § 102(e)**

Claims 1, 2, 9-14, 19-23, and 26-28 are rejected under 35 U.S.C. 102(e) as being anticipated by Papasakellariou (US 6,700,919; art of record). Applicants have amended claims 1, 11, 13, 21, 23 and 28 to further distinguish the present invention from Papasakellariou and have canceled Claims 2, 12, 14 and 22.

Papasakellariou fails to disclose any type of channel estimator that determines an initial channel estimate from the pilot data and subsequently updates or modifies the initial channel estimate based on pilot data or information data and hence does not anticipate the present invention. When the invention of Papasakellariou updates and modifies the initial channel estimate, the estimated information data and the signal received is required over the information data period. The invention of Papasakellariou will not work if it only has the pilot data and the signal received over the pilot data

period. In contrast, the present invention only requires the pilot data and the signal received over the pilot data period. The complexity of a receiver that employs the invention of Papasakellariou would be significantly higher than a receiver that employs the present invention as the invention of Papasakellariou would typically require the receiver to run the demodulator or equalizer more than one time.

Further, the terms "bias" and "biased" as used in the present invention cannot be equated with the terms "modified or updated". The term "bias" has a very specific statistical meaning. It means that if the underlying channel response is fixed, and if the channel estimator of the present invention is repeatedly applied to received signals with many different noise realizations, the averaged channel estimate over these many noise realizations does not converge to the true underlying channel response, but instead they differ by a bias. The key point of the present invention is to minimize the averaged channel estimation error at the expense of adding such a bias which is normally an undesirable long-term estimation property. This is very different from Papasakellariou, as according to its description, there is no indication therein that the resulting channel estimate is biased. In other words, when received signals having many different noise realizations are processed by the invention of Papasakellariou, the resulting channel estimate averaged over these many noise realizations should converge to the true channel response. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and remarks.

#### **4. Claim Rejections – 35 U.S.C. § 103(a)**

Claims 3-8, 15-18, 24 and 25 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Papasakellariou (US 6,700,919; art of record) in view of Magee (US 2003/0076904; art of record). Applicants have amended Claim 1, from which claims 3-8 depend, Claim 13, from which Claims 15-18 depend and Claim 23, from which Claims 24-25 depend.

The Examiner stated that, "Papasakellariou teaches all subject matter claimed except for teaching the steps of transforming", while "Magee teaches from the same field of endeavor as shown in figures 9-11, a method and apparatus for calculating the

scaled channel estimate by transforming...." "Therefore, it would have been obvious to modify the receiver of Papasakellariou by employing the teaching of Magee since it is just an alternative way of calculating the channel estimate." As noted above, the present invention is distinguishable from Papasakellariou. Further, because of this key feature of the present invention, the transformation and the inverse transformation is dependent on the training sequence(s) in use, unlike in Magee where a fixed well-known transformation, namely FFT, is used.

In the present invention, the transformation depends on the received signal and the initial channel estimate, while the FFT, as used in Magee, does not. Hence, it is not technically possible to combine Magee with Papasakellariou to generate a biased estimate as required additional operation are not disclosed or suggested by either Magee or Papasakellariou.

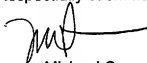
Hence, the combination of Papasakellariou and Magee fail to disclose the present invention as claimed in claims 3-8, 15-18, 24 and 25. Favorable reconsideration of the application is respectfully requested in view of the foregoing amendments and remarks.

## CONCLUSION

In view of the foregoing remarks, the Applicants believe all of the claims currently pending in the Application to be in a condition for allowance. The Applicants, therefore, respectfully request that the Examiner withdraw all rejections and issue a Notice of Allowance for claims 1, 3-11, 13, 15-21, and 23-28.

The Applicants request a telephonic interview if the Examiner has any questions or requires any additional information that would further or expedite the prosecution of the Application.

Respectfully submitted,



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